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MSTA

Dedicated to Quality Science Education

Montana Science Teachers Association

Newsletter

Volume 8
Number 4
Summer '90

Worth Saving!

About the Cover: Restoring our forests, protecting and reclaiming our topsoil, arresting desert expansion and protecting the ozone layer will take technological efforts of super-human dimensions. But all of these efforts will be for naught if the single greatest threat to our planet, the population growth, is not arrested. The crucial element in that effort is acceleration of population assistance and voluntary family planning efforts for developing countries. The *planet in hand* picture is from National Science & Technology Week '90, National Science Foundation, Room 527, 1800 G Street, N.W., Washington, D.C., 20550.

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CONVENTION UPDATE

Planning for the 1990 MSTA Convention is well on its way. The curricular groups met in Bozeman on May 7, to plan the convention with MEA. MSTA members will have nearly 100 workshops and sectionals to chose from, including all science areas and all levels. There are sectionals for primary level teachers, middle level teachers, as well as, sectionals for teachers of earth science, biology, chemistry, and physics. Most of the science sectionals have been planned to take place at Bozeman Junior High, but many will be at the Museum of the Rockies.

Larry Kirkpatrick of MSU will be the featured speaker at the *Bob Makela Memorial Luncheon.* The luncheon will be on Friday, October 19, 12 noon until 2 pm at the Baxter Hotel. You must buy your ticket for the luncheon when you preregister for the convention. The Holiday Inn will serve as the MSTA convention headquarters hotel. We have reserved 30 rooms for MSTA members, and encourage you to reserve your room early. If there are no MSTA rooms available at the Holiday, you may also reserve a room as an MEA member. To reserve a room, call or write: Holiday Inn, 5 Baxter Lane, Bozeman, Montana 59715, phone (406)587-4561.

BEST Bulletin

Summer is almost here...are you ready? Lots of exciting things will be happening next year so get rested up. I plan to hike a little, float a little and travel a little. Not much rest! We have a nearly final draft of the new BEST proposal for the National Science Foundation. It will take place next summer if it is funded and will involve many of you, if willing. It is called SCIpro which is the acronym for Science Curriculum Improvement project. It could also stand for science Professional which is what you will be.

Gerry Wheeler of MSU now has a $750,000 NSF grant called The *Science Teaching Institute in the Rockies* which is sort of a high school version of BEST. They can support 50 secondary teachers each summer for three years.

OPI has assigned me (volunteered?) to produce a science curriculum guide for science that will help schools meet the new accreditation standards. The *Montana Science Advisory Council* and the *Montana Science Teachers Association* have been assisting with the project. We plan to have a science curriculum development tool kit that will be available to schools this fall as school begins. It will assist schools with the formation of a science curriculum committee, school resources needed, philosophy, rationale, sequencing, development techniques, implementation, position papers, equipment and facilities, school support needs, evaluation and much more. It will be housed in a full color folder with bright inserts that can be added to or replaced as needed.

This TOOL KIT will be supported by a RESOURCE KIT containing lots of national reform documents, curriculum models, reference materials, sample evaluation tools, exams, etc. Schools that are serious about curriculum development will be able to check out these **RESOURCE KITS** from seven science resource centers at the various colleges. Math science funds will be available to assist school districts with the development process and hopefully they will eventually be supported by state funds.

The MSTA is working on a model curriculum guide that will meet the new standards. It will include a complete assessment package, with computer analysis, if all goes as planned.

Soon to come is development of a science **QUICK ASSESSMENT** that can be used to assess a teacher, department or school science program for any level. It only takes a teacher fifteen minutes including analysis of the results, a school can complete it in a couple of hours and an item analysis can be done in another hour or two. It is at the printers now.

SEEDS Project Statement

NASA issued the following statement recently about the SEEDS program:

The SEEDS project is a safe and valuable educational outreach program that will help increase scientific literacy among the nation's students.

Prior to initiating the program, which involved flying tomato seeds in space and distributing them to teachers, NASA asked the U.S. Department of Agriculture to evaluate the safety aspects and was assured there were no food safety risks associated with the tomato seeds and fruits they produced. A letter from the USDA stating this conclusion was included in every SEEDS teachers kit.

The USDA has reaffirmed that evaluation today. Dr. Alving Young, Science Advisor and Director of the Office of Agricultural Biotechnology, stated *that the space seed and the tomatoes they produce will be as safe as any tomatoes grown in a home garden.*

Representatives of the Park Seed Co., which provided the seeds, are handling the distribution for NASA and will participate in the analysis, concurred fully with Dr. Young's statement.

In addition, the Park Seed Company stated that *it believes the fruit produced by the space-flown tomato seeds will be as safe as any fruit you buy at your local grocers. We feel that the project is completely safe and one which hopefully will encourage the future scientists that this country so desperately needs.*

Dr. James Alston, research scientist with Park Seed Company, had the following comment:

During the summer of 1983, we grew vegetables including tomatoes, peppers, cucumbers and corn from seed flown in space during STS-6 in April 1983. I, and our Park Seed personnel, ate fruit from these plants with nothing except pleasurable experiences. I am planning to eat some of the fruit from the SEEDS project to see if I can discern any differences.

The tomato seeds in question were flown aboard the Long Duration Exposure Facility (LDEF), which was launched in April 1984. After returning LDEF to Earth, "the SEEDS tray was checked during the night of February 23, 1990, for radiation emission from the tray. Absolutely no harmful radiation was noted as coming from the SEEDS tray; thus, *the plants and fruits that subsequently develop will have no harmful radiation,* Park Seed Co. concluded.

Biology Teachers Form MBT as an Affiliate of MSTA

Following an informal luncheon meeting at the MSTA convention last fall, the biology teachers in attendance were unanimous in their support of founding an organization to exchange ideas concerning the teaching of biology in Montana. Over 50 teachers responded to a state-wide questionnaire pledging their support of such a group and all agreed that it should function as an affiliate of MSTA. The Montana Biology Teachers (MBT) will consist of a core group of interested teachers whose goal is to further biological education in our state. Many teachers will contribute teaching tips, favorite labs, field-trip ideas, etc. to the MSTA newsletter. Additional ideas for furthering the teaching of biology in Montana mentioned by respondees included:

*Organized field trips for teachers to bird refuges, etc. for exchanging both technical knowledge and field teaching techniques.

*Regional meetings of MBT in addition to the MSTA fall sectionals.

*Exchange of curriculum ideas concerning the content of biology courses.

*In addition to the MSTA dues, levy a small MBT membership fee to be used as a scholarship award to outstanding student projects in biology.

*MBT should be actively involved in organizing biology oriented sectionals at the fall MSTA convention.

*An annual luncheon meeting of MBT should be held at the MSTA convention.

*Develop a list of resource people in biology who are willing to work with students.

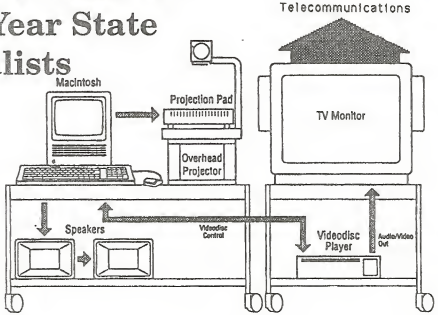
*Exchange ideas on how to survive in times of tight budgets.

*Establish a lab library which would include teachers' best homemade labs, equipment, ideas, demonstrations, etc.

Biology teachers who did not respond to the first call for membership may have their names included on the MBT mailing list by contacting Jim Cusker, Sentinel High School, 901 South Avenue, Missoula, MT 59801. Additional ideas concerning MBT are most welcome! Jim Cusker

If you have some respect for people as they are, you can be more effective in helping them to become better than they are.
...John W. Gardner

1990 Teacher of the Year State Finalists



Two characteristics set the 1990 Teacher of the Year program apart from previous years. The first was the number of entries—we received almost twice as many as last year. The second was the level of sophistication of the entries. The staff of *CCL* and the program judges agreed that students in schools today are using computers and other media in ways that rival applications in business, industry, and research. Despite what critics say about American education, when it comes to students' use of technology, we are clearly the best in the world. The winners chosen by our panel of judges were those teachers who were best able to:

- stimulate among students deeper thought or clearer understanding of issues, concepts, or ideas;
- improve literacy; and
- motivate disabled, underprivileged, or at-risk students.

State winners are listed on page 6. We don't have the space to describe each of their entries, but you can take our word that the creativity and effort they put forth were evident in the quality of their projects. Submissions included a full spectrum of topics from all subject areas and grade levels. Each winner will receive a PS/2® Model 25 system and software.

The *Teacher of the Year* will be chosen and announced in September and will receive from IBM a networked lab for his or her school.

The staff of *CCL*, the participating personnel from IBM, and the judges want to express appreciation to all the teachers who submitted entries to the IBM/*Classroom Computer Learning* Teacher of the Year Program. All entrants will receive a certificate in recognition of their participation. Your dedication and ability are a testament to the quality of American education and to your commitment to your students and your profession.

Sponsored by IBM and *Classroom Computer Learning*.

The 1990 Teacher of the Year State Winners

Congratulations to all those selected as semi-finalists in the Teacher of the Year program. Each semi-finalist named below was judged to be the most outstanding entrant from his or her state.

Jacqueline A. Matte, Mountain Brook Junior High School, Birmingham, Alabama
Dennis H. Stovall, Clark Junior High School, Anchorage, Alaska
James A. Madden, University High School, Tucson, Arizona
Terri K. Finkbeiner, Jefferson Elementary School, Little Rock, Arkansas
Gary Kukus, Hayward High School, Hayward, California
Jim Lamphear, Washington Irving Jr. High School, Colorado Springs, Colorado
Phil Nobile, Greenwich High School, Greenwich, Connecticut
Delbert B. Lumbert, Jr., Concord High School, Wilmington, Delaware
Leota Jane Moorefield, San Pablo Elementary School #80, Jacksonville Beach, Florida
Sheila Ruark, Baldwin High School, Milledgeville, Georgia
Linda Kishimoto, President William McKinley High School, Honolulu, Hawaii
Kenye LaVon Kingsford, Nampa Senior High School, Nampa, Idaho
Joan Brown, Irving Elementary School, Bloomington, Illinois
Paul E. Smith, Glenwood Middle School, Evansville, Indiana
Kenneth H. Stueve, East High School, Sioux City, Iowa
Janice E. Sim, Blue Valley North High School, Overland Park, Kansas
Jean Groves Merrell, West Broadway Elementary, Madisonville, Kentucky
Sheryl Abshire, College Oaks Elementary, Lake Charles, Louisiana
Ray Lund, Thornton Academy, Saco, Maine
Helen Hamerstrom, Severna Park Senior High, Severna Park, Maryland
Nancy Cook, Methuen High School, Methuen, Massachusetts
Trudie McMahon, Patrick Henry Middle School, Flat Rock, Michigan
Anthony J. Kinsella, Moorhead Senior High, Moorhead, Minnesota
Lynn H. Roth, Boyd Elementary School, Jackson, Mississippi
Marjorie K. Bramer, Phelps Center for Gifted Education, Springfield, Missouri
Richard A. Menger, Baker High School, Baker, Montana
Richard Reimer, Hastings Junior High School, Hastings, Nebraska
Susan J. Justad, Burkholder Junior High School, Henderson, Nevada
Margot H. Maddock, Francis C. Richmond School, Hanover, New Hampshire
Lynn Regan, Toms River Intermediate School, Toms River, New Jersey
Sylvia Mills, Zuni Elementary Magnet School, Albuquerque, New Mexico
Raymond Cohen, PS 238K, Brooklyn, New York
Sylvia Robinson, Wiley Middle School, Winston-Salem, North Carolina
Joe M. Lukach, Stanley High School, Stanley, North Dakota
Mark Emery, Southview High School, Lorain, Ohio
Gary D. Sacket, Chamberlain Middle School, Fairview, Oklahoma
Mike Weddle, Waldo Middle School, Salem, Oregon
Carolyn Cornish, Berlin Brothersvalley Junior/Senior High School, Berlin, Pennsylvania
John Macomber, Coventry High School, Coventry, Rhode Island
Clyde S. Sanders, Lexington Vocational Center, Lexington, South Carolina
Bill Zubke, Watertown Junior High, Watertown, South Dakota
Mary Virginia Meredith, West End Middle School, Nashville, Tennessee
Larry J. McHaney, J.L. McCullough High School, The Woodlands, Texas
J. Scott Harris, Logan High School, Logan, Utah
Edward Barry, School Street School, Milton, Vermont
Carolyn Tyson, Ulla F. Muller Elementary, St. Thomas, Virgin Islands
Jo Ann P. Mulvany, Mills E. Godwin High School, Richmond, Virginia
D. Richard Turnbull, Browns Point School, Tacoma, Washington
Amy C. Lee, Rabaut Junior High, Washington, DC
Dale Gemignani, F.J. Turner High School/Middle School, Beloit, Wisconsin
Charlotte Anne Dillon, United Career Center, Clarksburg, West Virginia
Elaine Ullery, Pinedale Middle School, Pinedale, Wyoming

SCIENCE OLYMPIAD

SCIENCE OLYMPIAD SUMMER INSTITUTES

Course Registration $185.00

Plan now to attend a Science Olympiad Summer Institute in some of the nation's most famous resort areas. These Institutes meet the requirements for the use of Title II EESA (Eisenhower Science Grant) and other staff development funds.

COME AND LEARN ABOUT: Elementary-Circuit Wizardry, Can-Can Racer, Large Number Estimation, Mystery Powders, Starry Starry Night, Catapult, Aerodynamics, Reflection Relay, Rock Hound and the Fun Day Program. Secondary - Astronomy, Topographic Maps, The Scrambler, Mousetrap Car, Rocks and Fossils, Designer Genes, Weather, Qualitative Analysis, Physics Lab and much more.

LEELANAU ENVIRONMENTAL CENTER, TRAVERSE CITY, MICHIGAN
Secondary: July 23-27, 1990 Elementary: July 16-20, 1990

ASILOMAR NATURE CENTER, MONTEREY, CALIFORNIA
Elementary: July 10-13, 1990

LAKESIDE RESORT, LAKE WALLENPAUPACK, PENNSYLVANIA
Secondary: July

THE NATURE PLACE, COLORADO SPRINGS, COLORADO
Secondary: August 4-8

BRIGHTON SUITES MOTEL, REHOBOTH BEACH, DELAWARE
Elementary and Secondary: June 18-22

Be the first to learn about new events and how to teach important concepts in your classroom and see why your colleagues recommend Science Olympiad Institutes.

EVALUATION FROM INSTITUTE PARTICIPANTS:
"This was an extremely informative 5 days. I've met a lot of interesting people who are a joy to work with and would be an asset to any school science department. The sharing sessions and the closeness I've felt here will last forever, I hope!"
"I loved the openness of the presenters and the participants. I love learning a lot yet having a relaxed atmosphere. A wonderful experience - all in the name of science."
"Well done, one of the BEST workshops I have ever attended, great facilities, very well organized."
*100% of the participants would recommend the Institutes to their colleagues.
*100% rated the Institutes EXCELLENT or VERY GOOD.

Name_____School_____Grade Level____
Home Address_____City_____State_____Zip_____
School Phone_____Home Phone_____Amt. Enclosed$_____

Which Institute are you interested in receiving information on (location)_____(date)_____

HOUSING: On site room and board includes meals from dinner on the first day to lunch the last day and four nights lodging. Rates range from $150 - $350 for double occupancy. For more details and registration information complete the form above. Please note: dates and locations are tentative. Send a $50 deposit to hold a place to:

Science Olympiad
5955 Little Pine Lane
Rochester, MI 48064

MONTANA TECH
Butte, Montana 59701
(406) 496-4101

Dear Science Educator,

We at Montana Tech's Math/Science Resource Center are pleased to announce several new programs to be offered during the spring and summer of 1990.

Earth Science Institute - Summer Program, funded by a grant from the Montana University system - Title II funds, will provide Earth Science teachers with an intensive three week summer program to be held in Butte June 11-30, 1990. The Summer Institute will blend lecture, hands-on laboratory exercises and field trip activities to provide participating teachers with a strong foundation in rock and mineral identification, structural geology, stratigraphy, weathering and mass wasting, introduction to hydrogeology, weather, weather prediction, observational astronomy and principles of aerodynamics. Participants receive a $250 stipend. (Enrollment limited to 12).

Rural Educators Integrated Science/Technology Institute, funded by a grant from the National Science Foundation, is a four week, field oriented program that integrates mathematics, geology, hydrogeology, chemistry, environmental engineering, biology and many other curricula as it addresses our changing Montana environment. The program will run June 25-July 20, 1990 and will be centered in Butte. Participants receive a $1200 stipend and room and board. (Enrollment limited to 20)

Summer Intern Program for Teachers, funded by the National Science Foundation (PROJECT PARTNERS grant) and the Montana Mining Association, is a four week internship at a specific mines throughout Montana. The program provides participants with an opportunity to learn about the "business of mining" from the inside out. Participants receive a $1200 stipend. (Enrollment limited to 12).

Mineral Education Program for Young Scholars, a four week summer program (June 24-July 20, 1990) for 9th - 11th grade high potential and/or high achievement students, funded by the National Science Foundation and presented in conjunction with the Montana Mining Association and the Montana Bureau of Mines and Geology. (Enrollment limited to 24).

If you would like more information on any of these programs, please call or write Nina Klein (496-4289) or Ginger Toivonen (496-4166)

Very Truly Yours,

Nina A. Klein
Science Director
Math/Science Resource Center

Ginger Toivonen
Mathematics Director
Math/Science Resource Center

Save The Rainforest May Report, by Bruce Calhoun Next Report: September

Status or STR

The total number of STR schools is now 7,000 in the USA. In addition to the USA schools we have cooperative relationships with student/educator organizations in Sweden, England, Japan, Germany, and most recently in Hong Kong, Australia and Canada. In Canada we are working with The Canadian Association for Science Education. In Australia we are working with the Education Department of La Trobe University in Bundoora, Victoria. We are working with The Hong Kong International School in Hong Kong. Through articles and notices in the NSTA Presents, The American Biology Teacher, The NEA Magazine and Scholastic's Science World we hope to double USA membership by the end of 1991. We hope to be featured on *The Discovery Channel* this fall.

The International Monetary Fund Petition

I have recently received feedback from Washington, DC on the effect of our petition. The U.S. Executive Director of the IMF has promised to set up an environmental unit within the IMF to review the environmental impact of IMF policies on developing countries. This is a major breakthrough and I have been informed by the Washington-based Environmental Defense Fund that our petition has been of great value.

Sometime between now and spring 91 Congress will have to approve a quota increase for the IMF. This will be our opportunity to demand some concrete progress on how the IMF is addressing the poverty and environment issue. It may be necessary to keep up the pressure on them to make sure the IMF does more than make cosmetic changes. If you still have signatures please send them in. To date we have raised 32,000 signatures from around the world. Many more are due in soon.

USA Letter writing campaign

Our letter writing campaign has been on target and will hopefully promote the passage of strong environmental laws. recently Congress passed The Global Environmental Protection Assistance Act of 1989 which will enable the U.S. government to fund debt-for-nature programs in developing countries. There is also the possibility of an increase in federal gasoline taxes which would not only curb CO_2 emissions but help cut our own federal deficit. It appears the Tongass National Forest is also going to receive greater protection. A special *Science World* issue will be coming out on the Tongass next fall.

Fund Raising and Conservation Projects

Funds, as well as petitions are just starting to come in. The amount of funds raised this spring will be reported in Sep-

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tember. The most popular conservation project has been land purchase in Costa Rica. As promised every penny sent in by schools is going directly to the conservation projects listed in our December Report. I wish to thank all the schools who have helped in the fund raising. For the school year 1990-91 we will be sending out recognition certificates to all schools who raise $50 or more.

Annual Meeting and Workshop

Our Annual Meeting will be held August 8-10 at the Yahara Center in Madison, Wisconsin. The cost for two nights lodging (double occupancy), and all meals will be $80. Registration is $15. We will be electing additional teachers to our board of directors and conducting an open board meeting to approve our 9091 activities. Our keynote speaker will be Cliff Messinger, Chairman of The Nature Conservancy. We will also have one of the most extensive insect collections in the world on display August 8th. In addition to this there will be many sessions on rain forest resource materials and rain forest conservation programs. To preregister and/or make your reservations please make out your checks to *Save The Rainforest* and send them to 604 Jamie St. Dodgeville, WI 53533 by June 30th.

Art Work Needed

We are seeking some original rain forest drawings to illustrate the certificates that we are going to be sending out to schools who raise funds for our 90-91 conservation projects. These drawings should fit on an 8 1/2 by 11 sheet of paper. They should also leave space for some text and a map insert. We would also like some drawings to illustrate our 1991 calender, as well as some new button designs (2 1/4 inch diameter).

1990-91 Activities, Early Information

Rain Forest Week will be October 22-29. There will also be an International Beach Appreciation Day on September 22. We are promoting Beach Day in conjunction with The United Nations Environment Program and CAPE (Children's Alliance to Protect the Environment). Activities you could plan around September 22 might be shoreline clean up of rivers, lakes, and oceans. You could also do water quality studies and investigate pollution sources in your community. Another 90-91 initiative will be to foster the recycling of paper. We can do that by creating a market for such paper through school purchases. Find out about recycled paper sources by looking under *Paper Distributors* in your yellow pages and then ask your school to consider switching to recycled paper. Following are some phone numbers of major distributors:

Conseratree Paper Co, CA (West/For district-wide orders) 415•433•1000 or 1•800•522•9200 if calling from outside CA

Leslie Paper Co, WI (Midwest/Ask for Keith Seeliger) 608•274•4580 or 1•800• 776 •3571 if calling from Wisconsin

Daniel Reich Inc, NY (Northeast/Ask for Marion Gaglrardo) 718•748•6000

How To Get Your Chapter or Group in the News

NSTA Reports! invites state chapters and other groups to submit items for publication that would be of interest to our nationwide audience. Approximate deadlines for submission of material occur two months before the month the issue will appear—for example, the March issue would have an early January deadline. We publish six issues per school year: September/October, November/December, January, February, March/April, and April/May.

We will try to use submitted items that appeal to groups across the country. Due to space constraints, however, we cannot guarantee that all submissions will be used. All items will be edited for space and style.

Send material to Debra Shapiro, Copy Editor, *NSTA Reports!*, 1742 Connecticut Ave. NW, Washington, DC 20009.

directory

1990 Interactive Healthcare Directory

The 1990 *Interactive Healthcare Directory* (ISBN 0-936999-14-4) is now available from Stewart Publishing, Inc., publishers of the *Interactive Healthcare Newsletter*. The 1990 *Directory* lists more than 560 proprietary and commercial videodisc, CD-ROM, and DVI applications for the health sciences—including ones for continuing education, nursing, health promotion, staff training, patient education, images storage and retrieval, and more. Along with a description of the program, the 1990 Directory lists Contact, Audience, Objectives, Hardware, Authoring, and Availability. There simply is no other resource like it anywhere. The *1990 Interactive Healthcare Directory* (formerly the *MedicalDisc Directory)* sells for $90 ($72 to Interactive Healthcare Consortium members). Please add $5 for postage and handling ($10 for overseas orders). Send all orders to Stewart Publishing, 6471 Merritt Court, Alexandria, VA 22312 (fax number 703•354•2177) or call us at 703•354•8155.

SCIENCE CURRICULUM GUIDE
MASTER PLAN

1) OPI will produce a light, brief, slick curriculum development tool kit in a folder. Both MSTA and MSAC will be fully credited.

2) OPI will produce, Title II will help fund, a Resource Kit to be used with the Science Curriculum Tool Kit that will consist of a box of the essential resources documents required for a thorough curriculum development. The kits will be checked out of the Math/Science Resource centers of NMC, UM, MSU, WMC, EMC and MTech. A list of the Resource Centers handling the Resource Kits will be included in the Tool Kit.

3) A set of position papers will be included in the OPI Science Curriculum Tool Kit but will be produced by MSAC.

4) MSTA will produce a sample science curriculum using the Virginia model. Other sample curricula from Montana will also be included.

5) MSTA will produce a complete assessment package to be used with the MSTA curriculum model, but that can be used with others as well. It is hoped that an IBM computer assisted analysis package will be available for this assessment.

6) The NSTA assessment package will be available through the Resource Kit for use with the MSTA or any other curriculum. This assessment can be hand scored or sent to NSTA for electronic scoring.

7) A video tape may be produced by MSU describing how to use the MSTA curriculum model and assessment package.

8) The NSTA standardized tests for Biology, Chemistry, Physics and Earth Science (assuming they are approved by the affiliates) will be available for use with school districts and promoted by MSTA for certain uses described below. Their potential for use in this way will be evaluated by the MSTA affiliate groups. These tests are not a replacement for student evaluation but are to assist with local school or district *program* evaluation.

a) Use as a teachers' indicator of the relative success of the local course.
b) Perhaps some anonymous use as an indicator of state success.
c) Perhaps some standard score to be determined my MSTA as a minimum target goal for all schools in Montana.
d) Great care taken to insure that the scores do NOT drive the curriculum and that teacher or school scores are not used for district comparisons, teacher evaluation etc.
e) May eventually need a way to do the same for elementary schools?

SAMPLE STUDY GUIDE

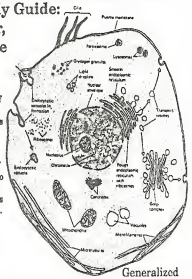
A study guide should contain elements that not only help the student, but his/her teacher and the student's parents. If the student is ever absent from class, the study guide can also be a source of assignments (for example: a reading assignment at home).

Unit Two: Cells Begin Date:

Chapter Study Guide: Chapter Four, Cell Structure

Chapter Objectives

1. State the four basic ideas of the cell theory.
2. Describe at least three ways in which cells differ from each other and in which they are similar.
3. Describe the special uses of several instruments used to study cells.
4. Describe the main functions of the major cell structures.
5. List the major differences among moneran cells, protist cells, fungal cells, plant cells, and animal cells.



Generalized Animal Cell

Proceed in the following order:

___1. Read the *Chapter Objectives* (6) above or on page 79 of your text. You should then have a good idea what you'll be learning about during this chapter.
___2. Read pages 79-91 in your text, making sure to complete the *Review It's* on pages 83 and 91. A *Cell Theory* handout is available to supplement this sheet.
___3. View the laserdisc movie on *General Functional Anatomy* of cells, chapter 18 of Principles of Biology.
___4. Read pages 92-93 in your text.
___5. Start laborotory *Studying Cell Parts* on page 31-32 of your lab manual.

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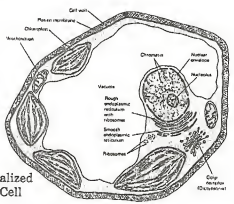
___6. Complete the computer program on *Cells: Structure and Function*, with supplement sheets for grading.
___7. Complete Study Sheet A, *The Parts of a Cell*, when ready.
___8. Start activity *Comparing Plant and Animal Cells* on page 94 in your text book, when ready.
___9. Complete Study Sheet B, *Cells from the Five Kingdoms*, when ready.
___10. Read pages 100-112 in your text, making sure to complete the *Review It* questions.
___11. Complete the computer program on *Photosynthesis and Respiration*, with supplement sheets for grading.
___12. Read the *Chapter Summary* and review the *Chapter Test* on pages 96 and 97 in your text.
___13. Take the *Oral Quiz*. If you are weak in any particular area of study, then you will be asked to review that material.
___14. Take the *Written Chapter Test*, if necessary.
___15. Proceed with Chapter 6, *Information Storage and Transfer in Cells* .



Generalized Plant Cell

Lab: Determining Forage Moisture Content

A microwave oven is a useful tool for testing the moisture content of a forage sample. To do the test, you will also need an accurate scale that will measure in grams and show 1-9 increments. A good balance is best, but a home food or diet scale is satisfactory.

Start with a representative sample of the forage. Mix a composite field sample and weigh out 100 9 of forage onto a dry, preweighed, microwave-safe plate. Place the plate with the sample in the oven and heat about 4 min for silage or 2 min for hay or drier forage. Then, remove the plate with sample from the oven, weigh it and record the weight.

Mix the sample again, then rotate and place the plate back into the microwave. Heat for another 30 to 60 sec, reweigh, and record the amount.

Continue to mix, reheat, reweigh, and record until the forage weight does not decrease by more than 2 g. At this point, you have reached the dry weight.

Do not let the forage burn or char. If it does, use the last recorded weight as the dry matter.

To determine the moisture content, subtract the final dry weight from the starting weight (100 g), not including the weight of the plate. The difference is the amount of water driven off the sample. Calculate the percentage of moisture.

There are no precise rules for drying times, as microwave ovens vary considerably in size and specifications, but most people can become adept and efficient in checking moisture after some trial and error and refinement with their own microwave.

Source: George Marx, extension animal scientist, University of Minnesota, Northwest Experiment Station, Crookston.

The moment a question comes to your mind, see yourself mentally taking hold of it and disposing of it.... Thus you learn to become the decider and not the vacillator.

H. Van Anderson

Water Trivia

The only water we will ever have is what we have right now.

Showers use 9 gallons of water per minute. A bath requires 30-50 gallons.

Once groundwater is polluted it may remain that way for several thousand years.

It can take 120 gallons of water to produce one egg.

A hot water faucet that leaks 60 drops per minute can waste 192 gallons of water and 48 kilowatt hours of electricity per month.

Human blood is 83% water. Human bones are 25% water.

Running the tap waiting for water to get hot or cold can waste 5 gallons per minute.

97% of the water on the earth is saltwater; only 3% is freshwater. Most of the freshwater stored on the earth is frozen in glaciers.

Each day the sun evaporates 1,000,000,000,000 (a trillion) tons of water.

The earth's surface is approximately 80% water.
That's about 362,000,000,000,000 (362 trillion) gallons of water.

Watermelon is 93% water.

"Water" was the first word that Helen Keller learned.
"Water" was the last word spoken by President Ulysses S. Grant.

In some deserts, rain is so uncommon that the natives do not have a word for it.

Over 42,000 gallons of water are needed to grow and prepare the food for a typical Thanksgiving dinner for eight in the United States.
This is enough water to fill a 30 by 50 foot swimming pool!

The people in the United States use as much as 700,000,000,000 (700 billion) gallons of water each day.

Heating water is the second largest energy user in the home.

The koala bear and the desert rat do not drink water.

There are about 8,000,000,000,000,000,000,000,000 (8 septillion) water molecules in one glass of water.

In a one hundred year period, a water molecule spends 98 years in the ocean, 20 months as ice, about 2 weeks in lakes and rivers, and less than a week in the atmosphere.

(Adapted from *Water Wonders*. National Rural Water Association, 1988.)

Aids Update

MONTANA
RESIDENT AND NON-RESIOENT AIDS CASES*
Acquired Immunodeficiency Syndrome (AIDS)
Definitive and Presumptive AIDS Cases
Surveillance Report - 4/1/90 to 4/30/90

1. Disease Category	Adult/Adolescent Cases (%)	Deaths (%)
PCP	29 (50)	19 (33)
Other Disease w/o PCP	26 (45)	18 (31)
KS Alone	3 (5)	0 (0)
No Diseases Listed	0 (0)	0 (0)
Total	58 (100)	37 (64)

2. Age	Cases (%)
Under 13	0 (0)
13-19	0 (0)
20-29	18 (31)
30-39	26 (45)
40-49	9 (16)
Over 49	5 (9)
Unknown	0 (0)
Total	58 (100)

3. Race/Ethnicity	Adult/Adolescent Cases (%)
White, Not Hispanic	53 (91)
Black, Not Hispanic	1 (2)
Hispanic	2 (3)
Native American	2 (3)
Unknown	0 (0)
Total	58 (100)

4. Exposure Category	Adult/Adolescent Males (%)	Females (%)	Total (%)
Homosexual or Bisexual Men	35 (61)	0 (0)	35 (59)
Intravenous (IV) Drug User	6 (10)	0 (0)	6 (11)
Homo/Bi IV Drug User	6 (10)	0 (0)	6 (11)
Hemophiliac	3 (5)	0 (0)	3 (5)
Heterosexual Contact	0 (0)	4 (7)	4 (7)
Transfusion With Blood/ Products	0 (0)	0 (0)	0 (0)
None of the Above/Other	3 (5)	1 (2)	4 (7)
Total	53 (91)	5 (9)	58 (100)

Source: Montana AIDS/STD Program, MDHES, through April 30, 1990.

*Includes 42 Montana AIDS cases and 16 cases reported to Centers for Disease Control from other states who are living in Montana.

As of April 30, 1990 there have been 253 positive HIV tests from 20,195 tests conducted through the MDHES Public Health Laboratory.

Nationally, as of March 31, 1990, 128,319 cases of AIDS and 78,340 deaths have been reported to the Centers for Disease Control.

The MSTA Board of Directors wishes every teacher a very happy summer.

postage

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Montana Science Teachers Association

MSTA will help the individual participate in determining the destiny of science in Montana. The organization serves as a vehicle for educators from all professions to exert positive influences on young people. Many important decisions concerning the scope and direction of science education will be strongly influenced by our organization.

MSTA goals are to increase public awareness, interest and support of science education in Montana.

MSTA

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